

## Claims

What is claimed is:

1           1.     Apparatus for implementing enhanced graphical user interface  
2 functions in a graphical debugger comprising:  
3           a user interface for operatively controlling a graphical user interface;  
4           a loadmap display manager coupled to said user interface for  
5 implementing a loadmap function;  
6           said user interface responsive to said loadmap display manager for  
7 displaying a program loadmap;  
8           a custom record display manager coupled to said user interface  
9 receiving user inputs and implementing a custom record display function;  
10          said user interface responsive to said custom record display manager  
11 for displaying user selected customized records.

1           2.     Apparatus for implementing enhanced graphical user interface  
2 functions as recited in claim 1 further includes a debugger server and  
3 wherein said loadmap display manager operatively controls said debugger  
4 server for implementing said loadmap function.

1           3.     Apparatus for implementing enhanced graphical user interface  
2 functions as recited in claim 2 wherein said load map function includes  
3 debugger means for reading debug data for a program under debug;  
4 examining the program debug data, for generating a list of each source and  
5 disassembly file contained in the program under debug, and for generating a  
6 list of each object or archive program bound to the program under debug at  
7 run time to generate said program loadmap for display.

1           4.     Apparatus for implementing enhanced graphical user interface  
2 functions as recited in claim 3 wherein said load map function further  
3 includes debugger means for identifying program load and unload events,  
4 and for dynamically updating said program loadmap for display as loadmap  
5 information changes responsive to program load and unload events;  
6 whereby said program loadmap enables setting a breakpoint within a user  
7 selected address range for one instance of a source file, without setting the  
8 breakpoint in other instances of the source file.

1           5.     Apparatus for implementing enhanced graphical user interface  
2 functions as recited in claim 2 wherein said custom record display manager  
3 operatively controls said debugger server for implementing said custom  
4 record display function; and said custom record display function includes  
5 debugger means for identifying a user selected variable, and user selected  
6 fields of the variable to be displayed.

1           6.     Apparatus for implementing enhanced graphical user interface  
2 functions as recited in claim 5 wherein said custom record display function  
3 further includes debugger means for identifying a user selected all variables  
4 of this type to be customized, for creating a custom record with the user  
5 selected fields and for adding said created custom record to a custom type  
6 list for displaying user selected customized records for all variables of this  
7 type only with the user selected fields.

1           7.     Apparatus for implementing enhanced graphical user interface  
2 functions as recited in claim 5 wherein said custom record display function  
3 further includes debugger means for creating a custom record with the user  
4 selected fields and for adding said created custom record to a variables list  
5 for displaying the variable only with the user selected fields.

1           8.     A debugger computer program product for implementing  
2 enhanced graphical user interface functions in a computer system, said  
3 debugger computer program product including instructions executed by the  
4 computer system to cause the computer system to perform the steps of:  
5           reading debug data for a program under debug;  
6           examining said program debug data, generating a list of each source  
7 and disassembly file contained in the program under debug, and generating  
8 a list of each object or archive program bound to the program under debug  
9 at run time to generate said program loadmap for display; and  
10          displaying said generated program loadmap on a graphical user  
11 interface.

1           9.     A debugger computer program product for implementing  
2 enhanced graphical user interface functions as recited in claim 8 includes  
3 the step of identifying program load and unload events, and dynamically  
4 updating said program loadmap for display as loadmap information changes  
5 responsive to program load and unload events.

1           10.    A debugger computer program product for implementing  
2 enhanced graphical user interface functions as recited in claim 9 wherein the  
3 step of identifying program load and unload events includes the steps of  
4 setting breakpoints at program load and unload entry points in the program  
5 under debug; and when debugging said program, identifying an unload  
6 breakpoint; and removing all information for an archive program being  
7 unloaded from said program loadmap to provide a current program loadmap,  
8 and displaying said current program loadmap.

1           11.    A debugger computer program product for implementing  
2 enhanced graphical user interface functions as recited in claim 8 includes  
3 the step of identifying a user selected variable and identifying user selected  
4 fields of the variable to be displayed, and creating a custom record with the  
5 user selected fields.

1           12.    A debugger computer program product for implementing  
2 enhanced graphical user interface functions as recited in claim 11 includes  
3 the step responsive to a user selection of all variables of this type to be  
4 customized, adding said created custom record to a custom type list for  
5 displaying user selected customized records for all variables of this type only  
6 with the user selected fields.

1           13.    A debugger computer program product for implementing  
2 enhanced graphical user interface functions as recited in claim 11 includes  
3 the step adding said created custom record to a variables list for displaying  
4 the variable only with the user selected fields.

1           14.    A debugger computer program product for implementing  
2    enhanced graphical user interface functions in a computer system, said  
3    debugger computer program product including instructions executed by the  
4    computer system to cause the computer system to perform the steps of:  
5           identifying a user selected variable and identifying user selected fields  
6    of the variable to be displayed,  
7           creating a custom record with the user selected fields; and  
8           displaying the variable only with the user selected fields.

1           15.    A debugger computer program product for implementing  
2    enhanced graphical user interface functions as recited in claim 14 wherein  
3    the step of displaying the variable only with the user selected fields includes  
4    the step adding said created custom record to a variables list for displaying  
5    the variable only with the user selected fields.

1           16.    A debugger computer program product for implementing  
2    enhanced graphical user interface functions as recited in claim 14 includes  
3    the step of identifying a user selection of all variables of this type to be  
4    customized, adding said created custom record to a custom type list for  
5    displaying user selected customized records for all variables of this type only  
6    with the user selected fields.

1           17.    A method for implementing enhanced graphical user interface  
2    functions in a graphical debugger comprising the steps of:  
3           utilizing a loadmap display manager for implementing a loadmap  
4    function and generating a program loadmap for a program under debug;  
5           displaying said generated program loadmap responsive to said  
6    loadmap function;  
7           utilizing a custom record display manager for receiving user inputs  
8    and implementing a custom record display function;  
9           displaying user selected customized records responsive to said  
10   custom record display function.

1           18.    A method for implementing enhanced graphical user interface  
2 functions in a graphical debugger as recited in claim 17 wherein the step of  
3 utilizing a loadmap display manager for implementing a loadmap function  
4 and generating a program loadmap for a program under debug includes the  
5 steps of reading debug data for a program under debug; examining said  
6 program debug data, generating a list of each source and disassembly file  
7 contained in the program under debug, and generating a list of each object  
8 or archive program bound to the program under debug at run time to  
9 generate said program loadmap for display; and displaying said generated  
10 program loadmap on a debugger graphical user interface.

1           19.    A method for implementing enhanced graphical user interface  
2 functions in a graphical debugger as recited in claim 18 includes the steps of  
3 identifying program load and unload events, dynamically updating said  
4 program loadmap and displaying said updated loadmap responsive to  
5 identified program load and unload events.

1           20.    A method for implementing enhanced graphical user interface  
2 functions in a graphical debugger as recited in claim 17 wherein the step of  
3 utilizing a custom record display manager for receiving user inputs and  
4 implementing a custom record display function includes the steps of  
5 identifying a user selected variable and identifying user selected fields of the  
6 variable to be displayed, creating a custom record with the user selected  
7 fields; and displaying the variable only with the user selected fields.

1           21.    A method for implementing enhanced graphical user interface  
2 functions in a graphical debugger as recited in claim 20 includes the steps of  
3 identifying a user selection of all variables of this type to be customized,  
4 adding said created custom record to a custom type list for displaying user  
5 selected customized records for all variables of this type only with the user  
6 selected fields.